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Implementation of Speech to-Text Application for Deaf Students on Inclusive Education Course

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Abstract: Inclusive education is an educational services system where people with disabilities can attend to the nearest regular school of their place, included college. Persons with hearing impairment is one of the minorities who is still marginalized from the right, including the needs of access to communications and information technology. Because of that, people with hearing impairment are not able to participate in instructional activities. Based on the observation and the interview, to graduate and undergraduate students with hearing impairment of Special Education department, they said that they still have problems in communicating with lecturers or other students, because of their inability to understand the explanation of the lecturer. This paper aims at providing an analysis of using speech to text app in an inclusive education course, which can record the voice of a lecturer and converted to text that is displayed through the power point, so that, the students with hearing impairment can read the text when the learning occurred. A classroom action research with tw0 cycle is used to recognize a summary of the instructional which attended by two students with hearing impairment and twenty-eight regular students. Observation, test, and interview conducted by team teaching show that speech to text based on power point has an impact in increasing comprehension of students with hearing impairment on inclusive education course.
Keywords: speech to text, hearing impairment, inclusive education

INTRODUCTION

The inauguration of inclusive education system that stated in Ministrial Regulation number 70 of 2009, people with disabilities have been accepted in the regular school and university. Irdamurni & Rahmiati (2015) states that inclusive education, as a education service that required all children with disabilities (visual impairement, hearing impairement, physical impairment, autism etc.) are served in schools nearby, in regular classes, together with regular students. Therefore, it should be emphasized to conduct the restructuring of schools and modification of science and technology in the learning process, in order to serve all students in appropriate learning process.

Hearing impairment or deaf is one type of disability. Persons with hearing impairment are individuals who lost all or half of the hearing so they difficult to communicate verbally although it has been given hearing aids and still required special education services (Irdamurni, 2018). Deaf students can receive information when they read the lips of speaker. Conversely if deaf students do not pay attention to the speaker, such as the teacher/lecturer, in explaining the material, they will not understand the material presented.

The development of information technology improves educational inovation in educating deaf students. Gales & Steve (2008) conducted research to apply algorithm Hidden Markov Models for Speech Recognition. This study reveals the development of Speech Recognition using algorithm Hidden Markov Model was greatly benefited from performance aspect and complexity because the Hidden Markov Model can display the rows of the vectors that needed by Speech Recognition (Fauzan, Arwani, & Fanani, 2018). The use of this Algorithm is also have high accuration of the Speech Recognition.

The author developed speech to-text applications. Speech to-text applications can be used to change the voice into text that can be displayed to the power point. The sound form of the input can be converted to text that can be read by the system. It is useful for deaf students because they can read the materials that delivered by teachers/ lecturers. Thus with the speech to-text app, deaf students with diverse characteristics in the classroom canunderstand the material that presented by teacher/lecturer.

The excess of speech to-text app is this app can affected human weakness, by the sound as the control. Through saying a word we can immediately get directly response from the computer (Hepril, 2017).

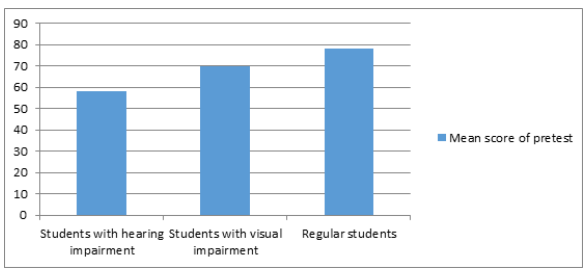
Tabel 1. The mean score of pretest

No	Subject	Mean score	Description
1	Students with hearing impairment	58	Poor
2	Students with visual impairment	70	Fair
3	Regular students	78	Good

Table 2. Mean score of post test

No	Subject	Pre-test	Post-test	Description
1	Students with hearing impairment	65	80	Good
2	Students with visual impairment	75	80	Good
3	Regular students	81	85	Very Good

Figure 1. Mean score of pretest



Speech to text/ Speech Recognition, can be found on windows Xp, windows vista and windows 7. On windows 7, speech recognition software is one of the items that are already on the menu control panel. Speech recognition is effective because it is easier for us in doing activities related to computer (Khan, 2019). We don't need to type on the keyboard, and don't need to move the mouse to enter the input. Because only through the sound and spelling of clearly Bahasa, the system can easily run to translate into text.

Through this way, we can determine when we need to type or edit the text immediately, and continue dictating to make the more appropriate sentences. Speech to text can be used to change the voice into text, so that it can be easier for users when they want to translate a language. The purpose of this article is to determine whether the speech to-text application can improve students' understanding of deaf students in learning material.

METHOD

This study used classroom action research. This research is conducted in the second semester of the 2018 academic year. The sample of this research is 30 students consists of a student with visual impairement, one deaf student and 28 regular students who take a inclusive education class in the department of special education, Education Faculty of UNP

Data collection techniques in this study using multi techniques. The learning activities conducted in the classroom on the subjects of inclusive education, and collaborated with team in inclusive education course. Data of the deaf students performances in inclusive education course achieved through pre-test and posttest. Pre test conducted at the beginning of the 1st cycle and the posttest was conducted after cycle 1 and cycle 2. This is conducted to determine the improvement of deaf students' performance in inclusive education course.

The data collected in classroom action research are quantitative data and qualitative data. The quantitative data is data numbers obtained from the pre-test and post-test. Quantitative data was analyzed uses descriptive analysis and visual presentation in tables and graphs. Presentation of data in tables and charts describes that the actions can causes an improvement. While qualitative data was qualitatively.

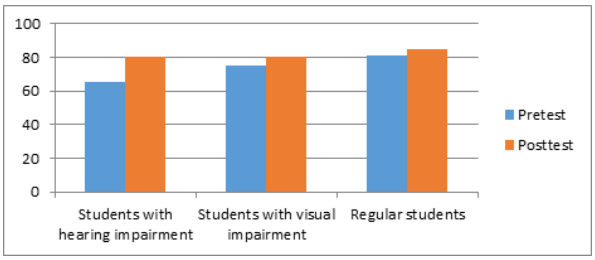
FINDINGS AND DISCUSSION

The implementation of speech to-text applications on inclusive education course conducted after mid semester, and before the mid semester, the learning process was not using the speech to-text app. The pre-test conducted to measure the performances of students on inclusive education course. The mean score of pre-test before using the speech to-text app are presented in table 1. For more details can be seen in Figure 1.

Based on Figure 1, it can be conccluded that the pre-test score of students with hearing impairment is poor, meaning that students with hearing impairment do not understand the material presented by the lecturer. After pre test score obtained, then the learning process continued with a cycle two, with implemented speech to-text app in the learning process. The material provided in according to the planning program of inclusive education courses. Cycle one is conducted in three meetings.

Besides the implementation of the test to the participants, addition data was also collected through interviews to students about the implementation of speech to text app. Opinion from interviews state that it need to increase the font size so that students is easy to read. In the first cycle, speech to-text app used 12 point Time New Roman font, but in cycle two, it used 16 point Times New Roman font. In the second cycle was conducted three meetings with the mean score are listed in table 2. For more details can be seen in Figure 2.

Figure 2. Mean score of post test



Speech to-text application is used to make deaf students focus to the material that delivered by the lecturer. They can understand the material through the text in power point. What material that delivered by the lecturer will be recorded through the screen of the power point. This is in according to the principles of learning for hearing impairment. Irdamurni (2018) stated that principle of directional orientation, the teacher should stand in front so that the face of the teacher, especially the teacher's mouth can be seen by the deaf students. It will help deaf students understand what is explained by the teacher. It needed to have face to face instructional with deaf students in the learning process so that the material can be understand by the students. This is in line with the opinion of the Tarmansyah (2009) that deaf students can receive information from what they saw.Through the speech to text app, the principles of instructional for deaf can be resolved. It means that the deaf students should not be always looking at the lecturer when explaining the learning material.

Tantowi (2016) explains about how to use Speech to text, here are the steps to activate it: 1. Click start , in the start button bottom left-hand corner, 2. Control Panel, 3. Ease of Access, 4. Speech Recognition . next connect the computer with the infocus along with the power point that was prepared for the regular students according to the material,

If teacher ever try this out, and about to set up the microphone, then just click the Start Speech Recognition. However, if this is the first time teacher try this software, then teacher should read to the steps how to upgrade by click on Start Speech Tutorial. Then if teacher have not set up a microphone yet, teacher can click Set Up Microphone. Select next, and continue to finish. Speech to text is already to used. Open at the windows display then there will be Speech Recognition box display.

On the box Speech Recognition, it written Sleeping which means software is not active. To activate it, teacher just need to Click on the button under a microphone picture and say "START". Then, the box will be inscribed the words "Listening" which means the software is ready to used. To continue, say: "I am now using speech recognition to dictate to the computer".After that, it is free to open any application. Speech Recognition will only work if we say it clearly. Unclearly spelling will only burden its work. Usually, when the intonation of pronunciation is not clear, the software remains silent. Therefore, to avoid this, the spelling should slowly and clearly.

CONCLUSION

Based on the result and discussion, it can be concluded that : The implementation of speech to-text application in learning process can improve deaf students' performances. Inclusive education course by using the speech to-text app can improve learning motivation of the deaf students . The speech to-text app can be used by connecting with the internet network. Because of the process uses google voice as a library for the matching process of the pronunciation of sounds and also as a validation. The text displayed of speech to-text application must be using 16 point font size so that the deaf students can read clearly.

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